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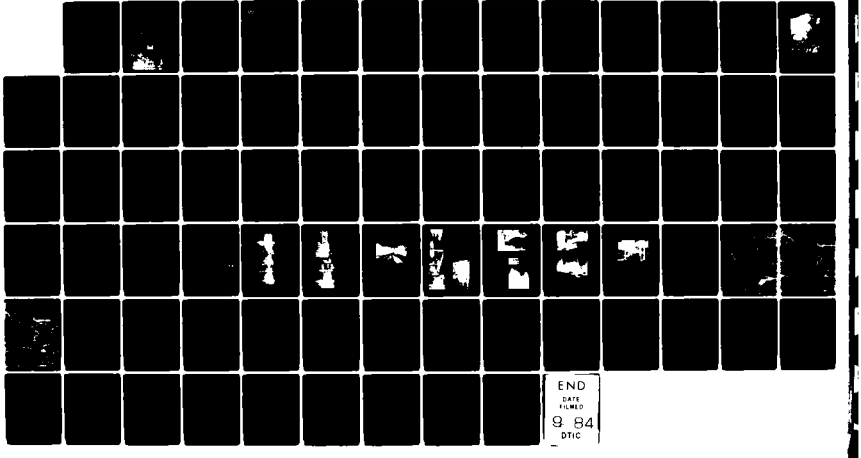

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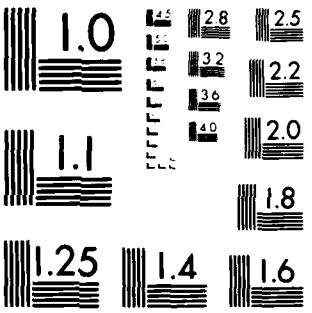

HOUSATONIC RIVER BASIN
SALISBURY, CONNECTICUT

TWIN LAKES DAM
CT 00593

PHASE I INSPECTION REPORT
NATIONAL DAM INSPECTION PROGRAM

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS

UNCLASSIFIED

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

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Cover program reads: Phase I Inspection Report, National Dam Inspection Program; however, the official title of the program is: National Program for Inspection of Non-Federal Dams; use cover date for date of report.

19. KEY WORDS (Continue on reverse side if necessary and identify by block number)

DAMS, INSPECTION, DAM SAFETY,

Housatonic River Basin
Salisbury, Connecticut

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

Twin Lakes Dam is a 20 foot high earthen embankment with the length of the embankment being approximately 100 feet. The visual inspection indicated the dam is in good condition. The "intermediate" size classification was based on a total storage of 9300 acre-feet as the 20 feet structure height was not a controlling factor. In conjunciton with this size classification and a hazard classification of "significant" a Test Flood of ½ the PMF was selected.

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DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION, CORPS OF ENGINEERS
424 TRAPELO ROAD
WALTHAM, MASSACHUSETTS 02154

REPLY TO
ATTENTION OF:
NEDED

DEC 17 1979

Honorable Ella T. Grasso
Governor of the State of Connecticut
State Capitol
Hartford, Connecticut 06115

Dear Governor Grasso:

Inclosed is a copy of the Twin Lakes Dam Phase I Inspection Report, which was prepared under the National Program for Inspection of Non-Federal Dams. This report is presented for your use and is based upon a visual inspection, a review of the past performance and a brief hydrological study of the dam. A brief assessment is included at the beginning of the report. I have approved the report and support the findings and recommendations described in Section 7 and ask that you keep me informed of the actions taken to implement them. This follow-up action is a vitally important part of this program.

A copy of this report has been forwarded to the Department of Environmental Protection, the cooperating agency for the State of Connecticut. In addition, a copy of the report has also been furnished the owner, Town of Salisbury.

Copies of this report will be made available to the public, upon request, by this office under the Freedom of Information Act. In the case of this report the release date will be thirty days from the date of this letter.

I wish to take this opportunity to thank you and the Department of Environmental Protection for your cooperation in carrying out this program.

Sincerely,

MAX B. SCHEIDER
Colonel, Corps of Engineers
Division Engineer

Incl
As stated

TWIN LAKES DAM

CT00593

HOUSATONIC RIVER BASIN

SALISBURY, CONNECTICUT

PHASE I INSPECTION REPORT
NATIONAL DAM INSPECTION PROGRAM

NATIONAL DAM INSPECTION PROGRAM
PHASE I - INSPECTION REPORT
BRIEF ASSESSMENT

Identification No:	CT 00593
Name of Dam:	Twin Lakes Dam
Town:	Salisbury
County and State:	Litchfield, Connecticut
Stream:	Schenob Brook
Date of Inspection:	April 23, 1979

Twin Lakes Dam is a 20 foot high earthen embankment with Town owned Twin Lakes Road along the entire crest. The length of the embankment appears to be approximately 100 feet. The top width of the dam is variable with a minimum width of about 35 feet at the gate control structure. Appurtenant structures include a cement rubble masonry headwall intake structure which contains one 24 inch and one 36 inch sluice-gated pipe as seen in photos 1, 2, 3, and 4. The 36 inch pipe goes to the out-of-service power house.

The visual inspection of Twin Lakes Dam indicated the dam is in good condition. The inspection revealed cracks parallel to the dam crest in the pavement on the crest and dipping of the road surface in the area of the intake structure. Brush and trees occupy the upstream face of the embankment left of the structure as seen in photos 1 and 2. The upstream face right of the structure, see photos 3 and 4, is a maintained lawn with trees. Trees are also found on the downstream face, as seen in photos 6, 7, and 8. Soil erosion and a wet area were observed on the downstream face of the embankment. Loose blocks of stone were found in the right downstream channel.

The "intermediate" size classification was based on a total storage of 9300 acre-feet as the 20 feet structure height was not a controlling factor. In conjunction with this size classification and a hazard classification of "significant" a Test Flood of 1/2 the Probable Maximum Flood was selected. Corps guidelines were followed in selecting the Test Flood.

There is no spillway at the dam. The outlet works consist of 1-24 inch diameter and 1-36 inch diameter pipe whose maximum possible discharge is 225 cfs. This capacity is considered insignificant in terms of consideration of the outlet works as a storm attenuating discharge facility. However, at the top of the dam elevation of 736 feet there is available surcharge storage of 3600 acre-feet which is equal to the test flood volume of 3610 acre-feet. Therefore, the test flood volume of 1/2 PMF will be contained without overtopping the dam and without releasing any of the storm inflow downstream.

Based on the findings of the visual inspection and hydrologic and hydraulic analysis, there is no need for comprehensive engineering studies or major alterations to the dam. Provisions should be made by the owner to investigate the cause and significance of the dip in the roadway in the area of the intake structure. Regular monitoring should be undertaken. Trees and shrubs on the embankment should be evaluated in regard to removal and properly removed and back-filled if required. Riprap should be placed on the upstream face of the dam. The area of soil erosion on the downstream face should be backfilled and planted. A proper vegetation maintenance program of the embankment should be commenced. Loose blocks of stone in the right discharge channel should be removed.

The recommendations and remedial measures are described in Section 7 and should be addressed within 2 years after receipt of this Phase I-Inspection Report by the owner.

Philip W. Genovese
President

PHILIP W. GENOVESE & ASSOCIATES, INC.
Hamden, Connecticut

This Phase I Inspection Report on Twin Lakes Dam has been reviewed by the undersigned Review Board members. In our opinion, the reported findings, conclusions, and recommendations are consistent with the Recommended Guidelines for Safety Inspection of Dams, and with good engineering judgement and practice, and is hereby submitted for approval.

Joseph W. Finegan

JOSEPH W. FINEGAN, JR., MEMBER
Water Control Branch
Engineering Division

Carney M. Terzian

CARNEY M. TERZIAN, MEMBER
Design Branch
Engineering Division

Joseph A. McElroy

JOSEPH A. MCELROY, CHAIRMAN
Chief, NED Materials Testing Lab.
Foundations & Materials Branch
Engineering Division

APPROVAL RECOMMENDED:

Joe B. Fryar

JOE B. FRYAR
Chief, Engineering Division

PREFACE

This report is prepared under guidance contained in the Recommended Guidelines for Safety Inspection of Dams, for Phase I Investigations. Copies of these guidelines may be obtained from the Office of Chief of Engineers, Washington, D.C. 20314. The purpose of a Phase I Investigation is to identify expeditiously those dams which may pose hazards to human life or property. The assessment of the general condition of the dam is based upon available data and visual inspections. Detailed investigation and analyses involving topographic mapping, subsurface investigations, testing and detailed computational evaluations are beyond the scope of a Phase I Investigation; however, the investigation is intended to identify any need for such studies.

In reviewing this report, it should be realized that the reported condition of the dam is based on observations of field conditions at the time of inspection along with data available to the inspection team. In cases where the reservoir was lowered or drained prior to inspection, such action, while improving the stability and safety of the dam, removes the normal load on the structure and may obscure certain conditions which might otherwise be detectable if inspected under the normal operating environment of the structure.

It is important to note that the condition of a dam depends on numerous and constantly changing internal and external conditions, and is evolutionary in nature. It would be incorrect to assume that the present condition of the dam will continue to represent the condition of the dam at some point in the future. Only through continued care and inspection can there be any chance that unsafe conditions be detected.

Phase I inspections are not intended to provide detailed hydrologic and hydraulic analyses. In accordance with the established guidelines, the Spillway Test Flood is based on the estimated "Probable Maximum Flood" for the region (greatest reasonably possible storm runoff), or fractions thereof. Because of the magnitude and rarity of such a storm event, a finding that spillway will not pass the test flood should not be interpreted as necessarily posing a highly inadequate condition. The test flood provides a measure of relative spillway capacity and serves as an aide in determining the need for more detailed hydrologic and hydraulic studies, considering the size of the dam, its general condition and the downstream damage potential.

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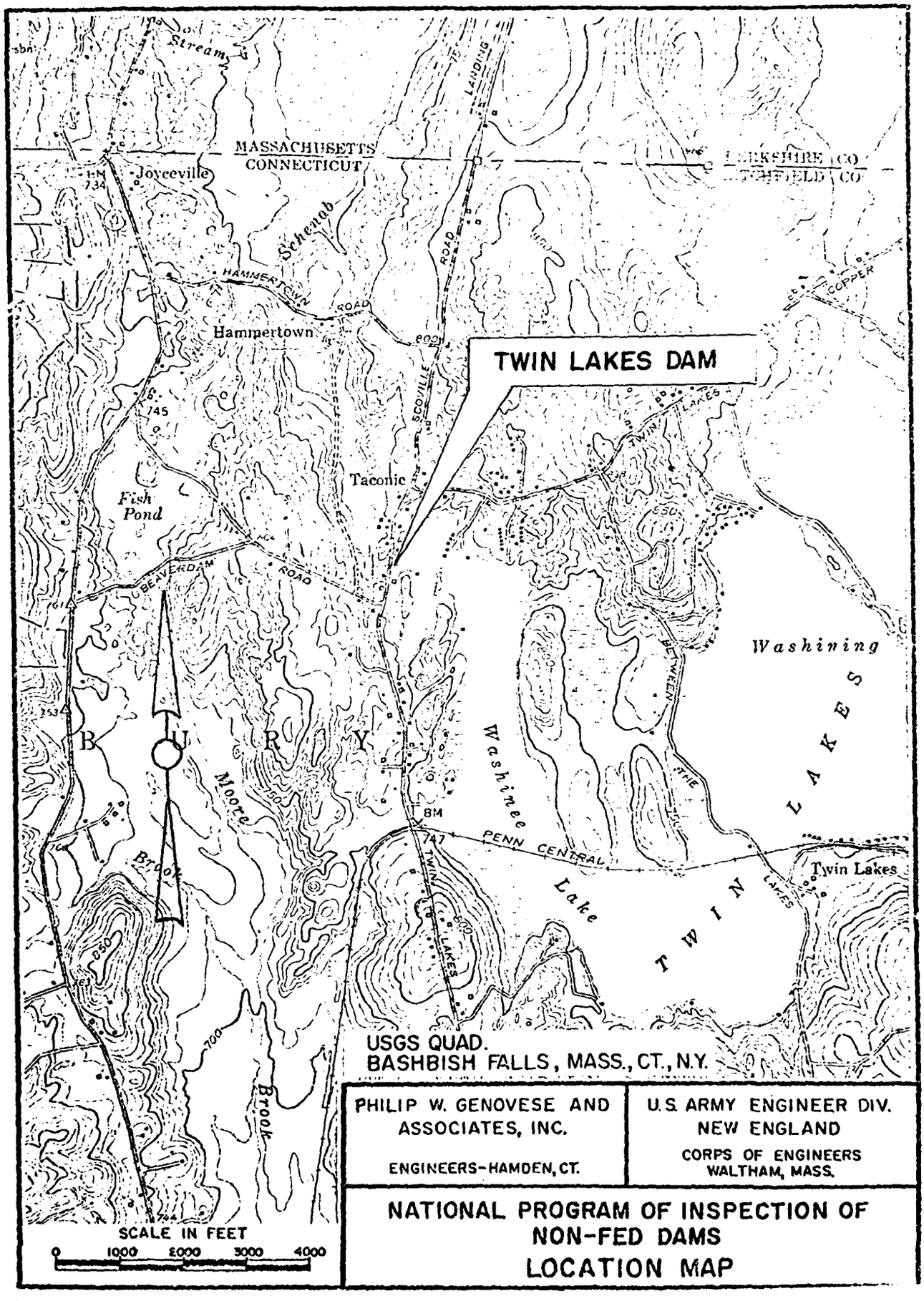
PHILIP W. GENOVESE AND ASSOCIATES, INC. ENGINEERS–HAMDEN, CT.		



PHILIP W. GENOVESE AND ASSOCIATES, INC. ENGINEERS-HAMDEN, CT.	U.S. ARMY ENGINEER DIV. NEW ENGLAND CORPS OF ENGINEERS WALTHAM, MASS.

NATIONAL PROGRAM OF INSPECTION OF NON-FED DAMS

LOCATION MAP

NATIONAL DAM INSPECTION PROGRAM
PHASE I INSPECTION REPORT

SECTION I

PROJECT INFORMATION

1. 1 General

a. Authority. Public Law 92-367, August 8, 1972, authorized the Secretary of the Army, through the Corps of Engineers, to initiate a National Program of Dam Inspection throughout the United States. The New England Division of the Corps of Engineers has been assigned the responsibility of supervising the inspection of dams within the New England Region. Philip W. Genovese and Associates, Inc., has been retained by the New England Division to inspect and report on selected dams in the State of Connecticut. Authorization and notice to proceed were issued to Philip W. Genovese and Associates, Inc., under a letter of November 28, 1978 from Max B. Scheider, Colonel, Corps of Engineers. Contract No. DACW33-79-C0019 has been assigned by the Corps of Engineers for this work.

b. Purpose.

(1) To perform technical inspection and evaluation of non-Federal dams to identify conditions which threaten the public safety and thus permit correction in a timely manner by non-Federal interests.

(2) To encourage and prepare the states to initiate quickly effective dam safety programs for non-Federal dams.

(3) To update, verify and complete the National Inventory of Dams.

1. 2 Description of Project

a. Location. Twin Lakes Dam is located on Schenob Brook in the Town of Salisbury, Connecticut. The dam is immediately south of the village of Taconic. The dam is on USGS

Quadrangle, Bashbish Falls, Connecticut with coordinates approximately N 42° 1.9', W 73° 24.7', Litchfield County, Connecticut. The location of the dam is shown on the Location Map immediately preceding this section.

b. Description of Dam and Appurtenances. Twin Lakes Dam consists of an earthen embankment with a paved Town road way along the entire crest. The dam appears to be about 100 feet in length. It is difficult to distinguish dam embankment from roadway embankment. Maximum structural height according to field measurements is 20 feet.

The appurtenant structures consist of a cement rubble masonry intake structure and two pipes which form the outlet works. There is no emergency spillway.

The outlet works consist of one 24 inch pipe and one 36 inch pipe with sluice gates on the intake side. The 36 inch pipe is directed through a former power house which discharges downstream of the structure into an open channel. The 24 inch pipe goes through the embankment and discharges into an open channel located in the right abutment. These two channels flow together about 100 feet downstream of the embankment as shown in the overview photo.

The two gates appear to be cast metal, mounted in metal guides & operated through a yoke mounted stem with handwheels mounted at top of threaded portion of stem; see photo No. 3 in Appendix C. The gates are operable and appear to be well maintained. They are fully opened for short periods, at a frequency of approximately 25 times a year.

Figure 1, located in Appendix B shows a sketch of the dam and its appurtenant structures. Photographs of the dam and appurtenances are shown in Appendix C. Additional sketches are shown in Appendix D.

c. Size Classification. Intermediate (hydraulic height - 20 feet high, storage 9293 acre-feet) based on storage (≥ 1,000 to 50,000 acre-feet) as given in Recommended Guidelines for Safety Inspection of Dams.

d. Hazard Classification. The dam's potential for damage rates it as a significant hazard classification. A major breach could result in a maximum flood wave stage of about 14 feet where Schenob Brook crosses Hammertown Road about 4700 feet downstream of the dam. Structures that could be affected include at least one house and a dairy farm immediately upstream of Hammertown Road. One house is located on the right abutment of the dam and could very well be destroyed. The vacant power station located in the dam embankment would also be destroyed upon a dam breaching. Potential for loss of life could very well be in the range of 3 to 8 people. The dairy farm may receive about 3 to 5 feet of flood wave.

e. Own ership. The dam is owned by the Town of Salisbury, Connecticut

f. Operator. This dam is owned and operated by the Town of Salisbury, Connecticut. The operator is Mr. Roy Sherwood, telephone 203-435-9512, (winter); 203-824-0147 (summer).

g. Purpose of Dam. This dam is used for recreational purposes.

h. Design and Construction History. There is no information available regarding the design and construction history of the dam. It is reported to have been built in the early 1900's for hydroelectric purposes.

i. Normal Operating Procedure. According to Mr. Roy Sherwood, water level is maintained between two reference marks located upstream of the intake structure. These marks are set in a ledge outcrop and have a vertical interval of 8 inches. The middle of the interval is elevation 732.0. Water level is maintained by a periodic gate adjustment.

1.3 Pertinent Data

a. Drainage Area. The drainage area tributary to Twin Lakes Dam consists of approximately 7.13 square miles. The reservoir area and swamp areas make up 27% of the total drainage area. Elevations in the basin range from about 740 feet to 970 feet MSL.

The reservoir consists of about 855 acres at the normal pool elevation. Numerous dwellings are located along the reservoir shores.

b. Discharge at Dam Site.

(1) The outlet works for the reservoir consists of one 24 inch pipe and one 36 inch pipe with sluice gates at the intake structure. The left, 36 inch pipe goes through the embankment into an old power station and then discharges into an open channel. The right, 24 inch pipe goes through the embankment and outlets at the downstream right abutment into a channel. The maximum possible discharge capacity of both pipes is approximately 225 cfs.

(2) There are no records of maximum discharge at the dam site. Residents report the dam has never been overtopped.

(3) The outlet works capacity with a water surface at the top of dam (elevation 736 feet) would be insignificant and was not considered in the rating curve for the dam.

(4) The outlet works capacity with the water surface at the test flood elevation is insignificant and was not considered in the rating curve for the dam.

(5) The volume of 1/2 PMF will be contained without overtopping the dam and without releasing any of the storm inflow downstream.

c. Elevation (feet above MSL)

(1) Streambed at centerline of dam - 716

(2) Maximum tailwater - N/A

(3) Upstream portal invert diversion tunnel - N/A

(4) Recreation pool - 732

(5) Full flood control pool - N/A

(6) Spillway - None

(7) Design surcharge - unknown

(8) Top dam - 736

(9) Test flood surcharge - N/A

d. Reservoir (miles)

(1)	Length of maximum pool	3.0
(2)	Length of recreational pool	3.0
(3)	Length of flood control pool	N/A

e. Gross Storage (acre-feet)

(1)	Recreation pool	5693
(2)	Flood control pool	N/A
(3)	Deleted	
(4)	Top of dam	9293

f. Reservoir Surface (acres)

(1)	Recreation pool	855
(2)	Flood control pool	N/A
(3)	Deleted	
(4)	Test flood pool	N/A
(5)	Top dam	1000

g. Dam

(1)	Type	earthen embankment
(2)	Length	100 feet
(3)	Height	20 feet
(4)	Top width - variable,	35 feet minimum
(5)	Side slopes - Upstream:	variable
	Downstream:	2.5:1

(6) Zoning - unknown

(7) Impervious core - unknown

(8) Cutoff - unknown

(9) Grout curtain - unknown

(10) Other - unknown

h. Diversion and Regulating Tunnel

none

i. Service Spillway - none

j. Outlet Works

(1) Type - 1- 24 inch gated pipe, 1-36 inch gated pipe

(2) Elevation

	Upstream	Downstream
24 inch	727.5	727.0
36 inch	728.5	716.0

(3) Maximum capacity - 225 cfs

(4) Gates - sluice

(5) Upstream channel - under water, not visible

(6) Downstream channel - pipes outlet to open channels which are joined about 100 feet downstream of the embankment.

k. Regulating Outlets. The reservoir can be drained by 24 and 36 inch outlet pipes. The pipes are controlled by sluice gates located at the intake structure on the upstream face of the dam. The 36 inch pipe goes through the out-of-service power station before outletting to an open channel. The 24 inch pipe discharges into an open channel located in the right abutment, 58 feet downstream of the centerline of the dam.

SECTION 2
ENGINEERING DATA

2.1 Design

This dam was constructed in the early 1900's for hydroelectric purposes. There are no plans available.

No engineering data was found for this dam.

2.2 Construction

No construction records were available for use in evaluating the dam.

2.3 Operation

No engineering operational data was disclosed.

2.4 Evaluation

a. Availability. No engineering data was found to be available.

b. Adequacy. The lack of in-depth engineering data did not allow for a definitive review. Therefore, the adequacy of this dam could not be assessed from the standpoint of reviewing design and construction data, but is based primarily on visual inspection, past performance history and sound engineering judgment.

c. Validity. The lack of engineering data eliminates a judgment of validity.

SECTION 3
VISUAL INSPECTION

3.1 Findings

a. General. The field inspection of Twin Lakes Dam was made on April 23, 1979. The inspection team consisted of personnel from Philip W. Genovese & Associates, Inc., and Geotechnical Engineers, Inc. Representatives of the Town of Salisbury were also present during portions of the inspection. Inspection checklists, completed during the visual inspection are included in Appendix A. At the time of the inspection, the water level was approximately at the invert of the intake structure elevation. Water was passing through both pipes. The upstream face of the dam could only be inspected above this water level.

b. Dam. The dam consists of an earthen embankment approximately 100 feet long. The crest is at elevation 736 feet according to field measurements.

Crest. An asphalt roadway runs the length of the dam crest. (See photo 5). The condition of the pavement is fair to good with some small cracks running parallel to the crest.

A 1 to 4 inch deep dip in the roadway surface was observed in the area of the intake gate structure. This depression extended across the width of the pavement and about 40 feet along the roadway.

Upstream Face. The upstream face to the left of the gate control structure and between the roadway along the crest and the reservoir is heavily covered with vegetation ranging from low brush to 2 foot diameter trees. (See photo 4). The upstream face to the right of the gate control structure is a well maintained lawn which is approximately 3 feet above the reservoir level. (See photo 1.) There was no riprap observed along the upstream face.

Downstream Face. The downstream face is predominantly a grassed slope with a brick and stone masonry house, originally used as a power house, located approximately in the center of the embankment. (See photo 11). The old power house and the entire downstream face is currently used as residential property. Large trees to 18 inches in diameter and shrubs are growing in numerous locations on the face.

A 3 foot wide area of erosion was observed approximately halfway up the embankment and about 15 feet to the right of the old power house.

A spongy , wet area was observed near the downstream toe on the left side of the dam. However, the water appeared to originate at some point up the valley wall to the left and downstream of the dam and was not flowing from the downstream embankment.

c. Appurtenant Structures.

The outlet works consists of a masonry wall, 2 feet handwheel yoke type sluice gates, one 24 inch and one 36 inch diameter pipe. The 24 inch pipe outlets to open channel at the right downstream abutment at elevation 727.0; the inlet is at elevation 727.5. The 36 inch pipe, inlet invert at elevation 728.5, outlets to the tailrace of the dormant powerhouse; the tailrace is at approximately elevation 716.0.

Visual inspection of the cement capped, rubble masonry structure that is located at the intake of the outlet works did not reveal any evidence of structural instability. The masonry appeared to be in good condition.

What could be observed of the gates, mainly the yoke, threaded portion of stem and handwheels appeared to be properly maintained. There is a trash rack serving the 24 inch pipe.

No observation was made of the 36 inch pipe; it is reported to be steel. The downstream end of the 24 inch pipe is visible and a clay pipe is indicated.

Partial clogging of the downstream portion of the 36 inch pipe, at a bend, has been reported. This has not been verified as to nature nor extent. This, however, is a recent event as it has not occurred in the past.

d. Reservoir Area. The reservoir area has flat to rolling terrain, partially wood covered. A more detailed description of the drainage area is included in Section 1-3 of this report.

e. Downstream Channel. Two downstream discharge channels, one from the powerhouse and one from the 24 inch discharge pipe near the right abutment have irregular stream beds and are generally unobstructed. The training walls for the upper portion of the right channel are vertical stone masonry walls with some of the stone blocks observed to be loose.

3.2 Evaluation.

Visual examination indicates that the dam is in good condition. Tree growth on the upstream and downstream face could create a future seepage problem since the tree roots can provide a seepage path for water if the tree roots are allowed to grow without limit. The depression in the roadway on the crest of the dam, opposite the gate control structure, could be due to poor compaction around the two discharge pipes or loss of soil along the outside of the discharge pipes.

SECTION 4
OPERATIONAL PROCEDURES

4.1 Procedure

The dam creates an impoundment of the water which is used primarily for recreation. The normal operational procedure is to maintain a water level approximately at the normal pool level of 732 feet.

4.2 Maintenance of Dam

The dam is visited on an average of every two weeks. During these visits general maintenance, when deemed necessary is accomplished.

4.3 Maintenance of Operating Facilities

Maintenance on the operating facilities is done on an as required basis.

4.4 Description of Warning Systems

There are no warning systems at this facility.

4.5 Evaluation

Maintenance of the dam proper could be improved as regards consideration of trees and brush removal from the embankment. The operation of the dam appears to be conducted at an acceptable level of performance at this time. It would be advisable, however, to have a written operation and maintenance manual. This manual would provide the necessary inspection, maintenance, and operation procedures that would lead to a more uniform approach to care of the dam and its appurtenances.

SECTION 5
HYDROLOGY AND HYDRAULIC ANALYSIS

5.1 Evaluation of Features

General. Twin Lakes Dam consists of an earthen embankment about 100 feet long with a paved Town road running along the entire crest. A gate control structure is located on the upstream side of the embankment and 24 and 36 inch pipes run from the structure through the embankment to discharge downstream of the dam. These two pipes constitute the outlet works. There is no emergency spillway.

a. Design Data. No hydrologic or hydraulic design data were disclosed for this dam.

b. Experience Data. The maximum discharge at this dam site is unknown. Local residents report that the dam has never been overtopped.

c. Visual Observations. No evidence of damage to any portion of the project from overtopping was visible at the time of the inspection.

d. Test Flood Analysis. As no design and operational information were available, hydrologic evaluation was performed using information gathered by field inspection, watershed size, and an estimated test flood equal to 1/2 Probable Maximum Flood (PMF) as determined by guide curves issued by the Corps of Engineers. Based on a drainage area of 7.13 square miles, it was estimated that the Test Flood would be 3565 cfs. The Test Flood volume is 3610 acre-feet. Following the guidance for Estimating Effect of Surcharge Storage on Maximum Probable Discharges results in available surcharge storage of 3600 acre-feet at the top of the dam elevation of 736 feet. The volume of 1/2 PMF will be contained without overtopping the dam.

e. Dam Failure Analysis. The impact of failure of the dam at maximum pool (top of dam) was assessed using the "Rule of Thumb" Guidance for Estimating Downstream Dam Failure Hydrographs issued by the Corps of Engineers.

The dam's potential for damage rates it as a significant hazard classification. A major breach could result in a maximum flood wave stage of about 14 feet where Schenob Brook crosses Hammertown Road about 4700 feet downstream of the dam. Structures that could be affected include at least one house and a dairy farm immediately upstream of Hammertown Road. One house is located on the right abutment of the dam and could

very well be destroyed. The vacant power station located in the dam embankment would also be destroyed upon a dam breaching. Potential for loss of life could very well be in the range of 3 to 8 people. The dairy farm may receive about 3 to 5 feet of flood wave. The breaching discharge was computed to be 4060 cfs.

SECTION 6
STRUCTURAL STABILITY

6.1 Evaluation of Structural Stability

a. Visual Observations. The visual examination did not disclose any immediate stability problems. Based only on this visual inspection, it is not apparent whether the depression of the roadway on the dam crest in the area of the gate control structure was due to poor placement of the embankment material during construction or to possible internal erosion of the embankment soil.

b. Design and Construction Data. Design drawings are not available for the dam.

c. Operating Records. No operating records pertinent to the structural stability of the dam were available.

d. Post Construction Changes. There was no information available about post construction changes.

e. Seismic Stability. The dam is located in Seismic Zone 1, and in accordance with recommended Phase I guidelines does not warrant seismic analysis.

SECTION 7
ASSESSMENT, RECOMMENDATIONS AND REMEDIAL MEASURES

7.1 Dam Assessment

a. Condition. The visual examination indicates that the dam is in good condition. The inspection revealed:

1. Cracks in the pavement on the crest of the dam which are parallel to the crest.
2. Dip in the roadway surface up to 4 inches in the area of the intake structure continuing about 40 feet along the roadway.
3. The upstream face of the embankment is covered with vegetation, brush, and trees on the left side. The right side is a maintained lawn with trees and bushes. No riprap exists on the upstream face.
4. The downstream face has many large trees and shrubs growing from the embankment. An area of erosion is located 15 feet right of the old power house halfway up the embankment. A wet area was observed near the downstream toe at the left side of the dam.
5. The right discharge channel contains stone blocks that appear to have fallen from the training walls.

b. Adequacy of Information. The lack of in-depth engineering data did not allow for a definitive review. Therefore, the adequacy of this dam could not be assessed from the standpoint of reviewing design and construction data, but is based primarily on visual inspection, past performance history and sound engineering judgement.

c. Urgency. This dam is in good condition. The recommendations and remedial measures described in Sections 7.2 and 7.3 should be accomplished within two years after receipt of this Phase I Inspection Report by the owner.

d. Need for Additional Investigation. The findings of this inspection indicate that there is no need for additional investigations.

7.2 Recommendations

Based on the findings of the visual inspection and hydrologic and hydraulic analysis, there is no need for comprehensive engineering studies or for major alterations to the dam. However, the remedial measures will require additional engineering input, analysis, and design.

a. The owner should retain the services of a professional engineer to investigate the cause and significance of the dip in the roadway on the crest of the dam in the area of the gate control structure.

b. All trees and shrubs on the dam embankment should be evaluated as to whether they should remain. If removed, the resulting stump and root voids shall be backfilled with proper material.

7.3 Remedial Measures

a. Riprap should be placed along the upstream face of the dam.

b. The area of erosion on the downstream face to the right of the old pump house should be backfilled and grassed.

c. The depression in the roadway on the crest of the dam should be monitored regularly to determine if it is increasing in size. Continued subsidence could lead to cracking of the discharge pipes in the embankment which could cause the embankment to fail as a result of piping.

d. The owner should maintain vegetation on the embankment, normally grass, in order to stabilize the slopes and reduce chances of surface erosion.

e. The loose stone blocks in the training walls of the right discharge channel should be reset.

f. An operational procedure and formal warning system for emergency conditions should be established.

g. A biennial technical inspection program should be developed which also includes the outlet works to insure operability and clearance of any blockages.

7.4 Alternatives

There are no practical alternatives to the recommendations in Sections 7.2 and 7.3.

APPENDIX A

INSPECTION CHECKLIST

VISUAL INSPECTION CHECKLIST
PARTY ORGANIZATION

PROJECT Twin Lakes Dam

DATE April 23, 1979

TIME P.M.

WEATHER Fair- 70's

W.S. ELEV. _____ U.S. ____ DN.S

PARTY

1. Joe Engels Geotechnical
2. Dick Murdock "
3. Bob Jones Party Chief
4. Don Ballou Hydraulics/Hydrology

PROJECT FEATURE	INSPECTED BY	REMARKS
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		

PERIODIC INSPECTION CHECKLIST

PROJECT: Twin Lakes Dam DATE April 23, 1979

PROJECT FEATURE Earthen Dam Embankment NAME

DISCIPLINE NAME

	AREA EVALUATED	CONDITION
	DAM EMBANKMENT	
	Crest Elevation	736.0
	Current Pool Elevation	732.0
	Maximum Impoundment to Date	5693 acre-feet
GEI	Surface Cracks	See Pavement
GEI	Pavement Condition	Fair to Good. Some pavement cracks parallel to crest.
GEI	Movement or Settlement of Crest	Dip in roadway at gate structure.
GEI	Lateral Movement	None observed
GEI	Vertical Alignment	No irregularities observed
GEI	Horizontal Alignment	
GEI	Condition at Abutment and at Concrete Structures	Good
GEI	Indications of Movement of Structural Items on Slopes	None observed
GEI	Trespassing on Slopes	Residential Property. Lawns on downstream slope.
GEI	Sloughing or Erosion of Slopes or Abutments	Small slough 3' wide approximately one-halfway up downstream slope, 15' to right of power house.
GEI	Rock Slope Protection- Riprap Failures	No riprap
GEI	Unusual Movement or Cracking at or Near Toe	None observed
GEI	Unusual Embankment or Downstream Seepage	None observed. Spongy wet area near left side toe contact but water originating up the left valley wall, not through dam.

PERIODIC INSPECTION CHECKLIST

PROJECT: Twin Lakes Dam DATE April 23, 1979

PROJECT FEATURE Earthen Dam Embankment NAME

DISCIPLINE NAME

	AREA EVALUATED	CONDITION
	DAM EMBANKMENT - Continued	
GEI	Piping or Boils	None observed
GEI	Foundation Drainage Features	None observed
GEI	Toe Drains	None observed
GEI	Instrumentation System	None observed
GEI	Vegetation	Trees to 18" diameter and brush on upstream and downstream slopes and crests. Residential plantings.

PERIODIC INSPECTION CHECKLIST

PROJECT: Twin Lakes Dam DATE April 23, 1979

PROJECT FEATURE Other Embankment NAME

DISCIPLINE NAME

	AREA EVALUATED	CONDITION
	DIKE EMBANKMENT	
	Crest Elevation	No Dike Present
	Current Pool Elevation	
	Maximum Impoundment to Date	
GEI	Surface Cracks	
GEI	Pavement Condition	
GEI	Movement or Settlement of Crest	
GEI	Lateral Movement	
GEI	Vertical Alignment	
GEI	Horizontal Alignment	
GEI	Condition at Abutment and at Concrete Structures	
GEI	Indications of Movement of Structural Items on Slopes	
GEI	Trespassing on Slopes	
GEI	Sloughing or Erosion of Slopes or Abutments	
GEI	Rock Slope Protection- Riprap Failures	
GEI	Unusual Movement or Cracking at or Near Toes	
GEI	Unusual Embankment or Downstream Seepage	
GEI	Piping or Boils	
GEI	Foundation Drainage Features	
GEI	Toe Drains	
GEI	Instrumentation System	
GEI	Vegetation	

PERIODIC INSPECTION CHECKLIST

PROJECT: Twin Lakes Dam DATE April 23, 1979

PROJECT FEATURE Outlet Works- Intake NAME

DISCIPLINE NAME

	AREA EVALUATED	CONDITION
	OUTLET WORKS - INTAKE CHANNEL AND INTAKE STRUCTURE	
	a. Approach Channel	Underwater, Not Observed
GEI	Slope Conditions	
GEI	Bottom Conditions	
GEI	Rock Slides or Falls	
	Log Boom	
	Debris	
	Condition of Concrete Lining	
GEI	Drains or Weep Holes	
	b. Intake Structure	N/A
	Condition of Concrete	
	Stop Logs and Slots	

PERIODIC INSPECTION CHECKLIST

PROJECT: Twin Lakes Dam DATE April 23, 1979

PROJECT FEATURE Outlet Works- Control Tower NAME

DISCIPLINE NAME

AREA EVALUATED	CONDITION
OUTLET WORKS- CONTROL TOWER	
a. Concrete and Structural	N/A
General Condition	
Condition of Joints	
Spalling	
Visible Reinforcing	
Rusting or Staining of Concrete	
Any Seepage or Efflorescence	
Joint Alignment	
Unusual Seepage or Leaks in Gate Chamber	
Cracks	
Rusting or Corrosion of Steel	
b. Mechanical and Electrical	
Air Vents	
Float Wells	
Crane Hoist	
Elevator	
Hydraulic System	
Service Gates	
Emergency Gates	
Lightning Protection System	
Emergency Power System	
Wiring and Lighting System	

PERIODIC INSPECTION CHECKLIST

PROJECT: Twin Lakes Dam DATE April 23, 1979

PROJECT FEATURE Outlet Works- Transition NAME

DISCIPLINE NAME

AREA EVALUATED	CONDITION
OUTLET WORKS- TRANSITION AND CONDUIT	
General Condition of Concrete	N/A
Rust or Staining on Concrete	
Spalling	
Erosion or Cavitation	
Cracking	
Alignment of Monoliths	
Alignment of Joints	
Numbering of Monoliths	

PERIODIC INSPECTION CHECKLIST

PROJECT: Twin Lakes Dam DATE April 23, 1979

PROJECT FEATURE Outlet Works - Channel NAME

DISCIPLINE NAME

	AREA EVALUATED	CONDITION
	OUTLET WORKS - OUTLET STRUCTURE AND OUTLET CHANNEL	
	General Condition of Concrete	N/A
	Rust or Staining	N/A
	Spalling	N/A
	Erosion or Cavitation	N/A
	Visible Reinforcing	N/A
	Any Seepage or Efflorescence	N/A
	Condition at Joints	N/A
GEI	Drain Holes	None observed
GEI	Channel	Fair- Dry masonry training walls. Some loose stone blocks
GEI	Loose Rock or Trees Overhanging Channel.	Trees to 6" diameter overhanging
GEI	Condition of Discharge Channel	Fair

PERIODIC INSPECTION CHECKLIST

PROJECT: Twin Lakes Dam DATE April 23, 1979

PROJECT FEATURE Outlet Works - Spillway NAME

DISCIPLINE NAME

	AREA EVALUATED	CONDITION
	OUTLET WORKS - SPILLWAY WEIR, APPROACH AND DISCHARGE CHANNELS	
	a. Approach Channel	No spillway
GEI	General Condition	
GEI	Loose Rock Overhanging Channel	
GEI	Trees Overhanging Channel	
GEI	Floor of Approach Channel	
	b. Weir and Training Walls	N/A
	General Condition of Concrete	
	Rust or Staining	
	Spalling	
	Any Visible Reinforcing	
	Any Seepage or Efflorescence	
GEI	Drain Holes	
	c. Discharge Channel	N/A
GEI	General Condition	
GEI	Loose Rock Overhanging Channel	
GEI	Trees Overhanging Channel	
GEI	Floor of Channel	
GEI	Other Obstructions	

PERIODIC INSPECTION CHECKLIST

PROJECT: Twin Lakes Dam DATE April 23, 1979

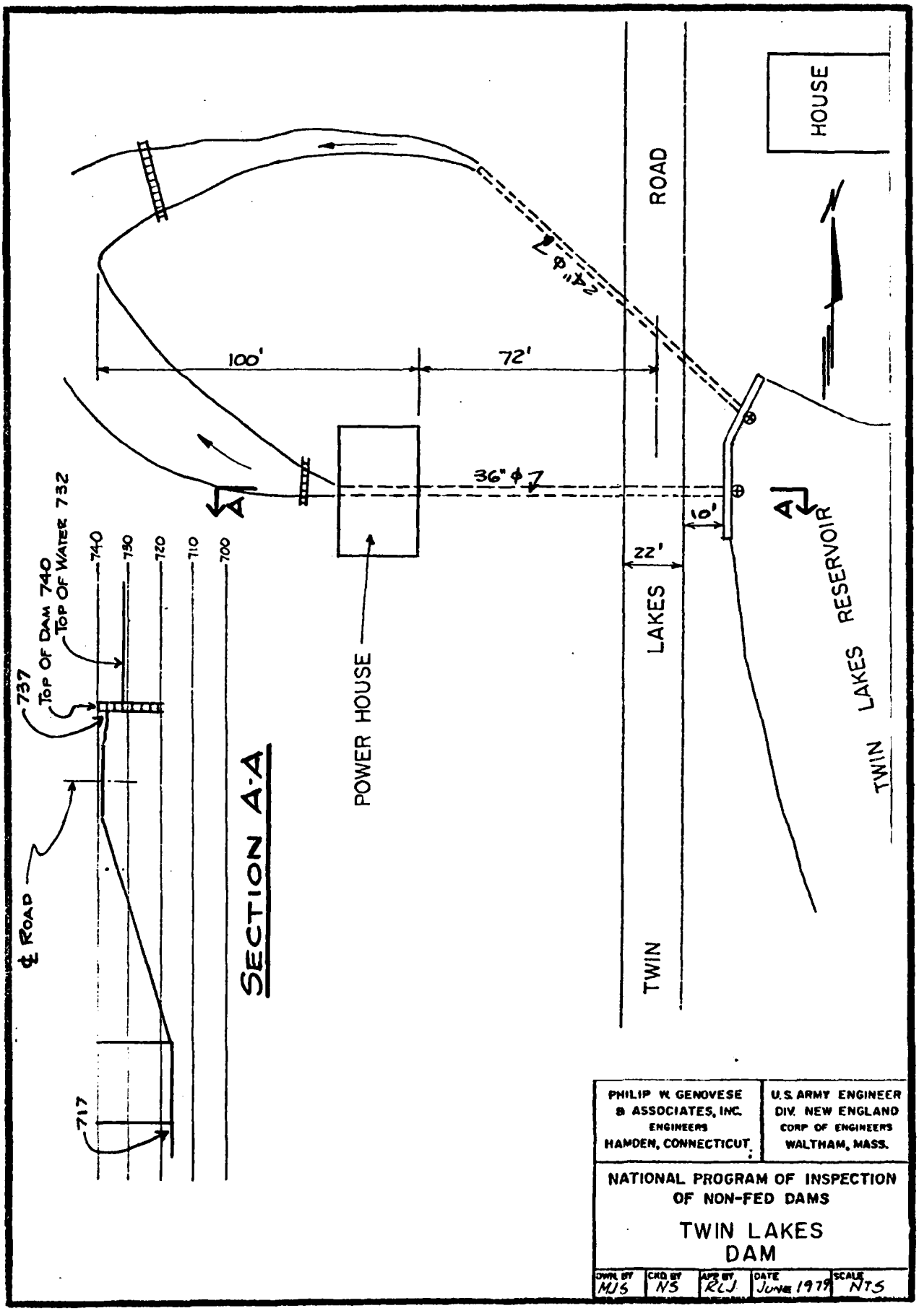
PROJECT FEATURE Outlet Works- Service Bridge NAME

DISCIPLINE NAME

AREA EVALUATED	CONDITION
OUTLET WORKS- SERVICE BRIDGE	
a. Super Structure	N/A
Bearings	
Anchor Bolts	
Bridge Seat	
Longitudinal Members	
Underside of Deck	
Secondary Bracing	
Deck	
Drainage System	
Railings	
Expansion Joints	
Paint	
b. Abutment and Piers	
General Condition of Concrete	
Alignment of Abutment	
Approach to Bridge	
Condition of Seat & Backwall	

APPENDIX B

ENGINEERING DATA



PHILIP W. GENOVESE & ASSOCIATES, INC. ENGINEERS HAMDEN, CONNECTICUT	U.S. ARMY ENGINEER DIV. NEW ENGLAND CORP OF ENGINEERS WALTHAM, MASS.

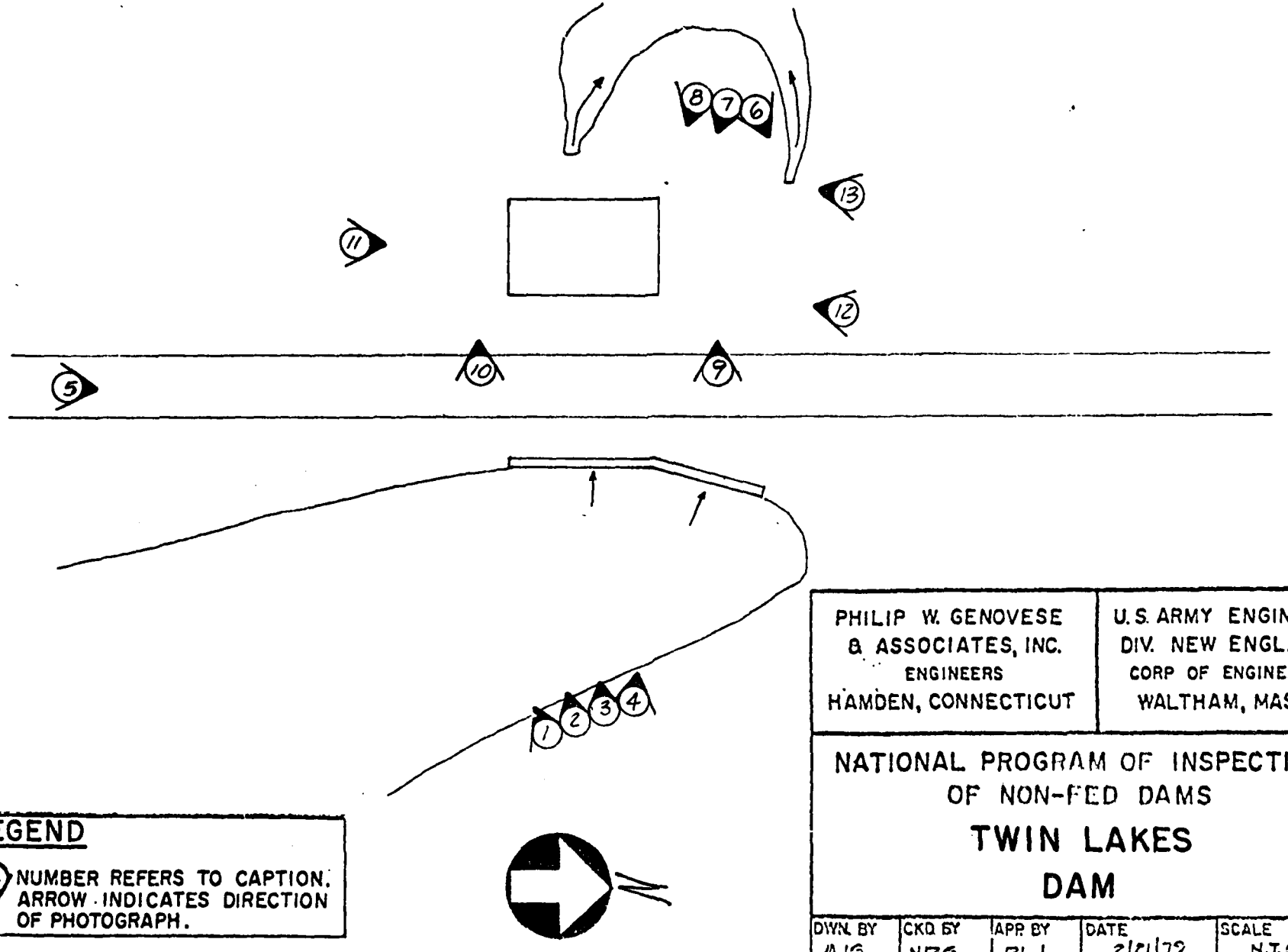
NATIONAL PROGRAM OF INSPECTION OF NON-FED DAMS

TWIN LAKES DAM

DWN. BY	CKD. BY	APP'D BY	DATE	SCALE
MJS	NS	RCJ	June 1979	NTS

APPENDIX C

PHOTOGRAPHS



LEGEND

④ NUMBER REFERS TO CAPTION. ARROW INDICATES DIRECTION OF PHOTOGRAPH.

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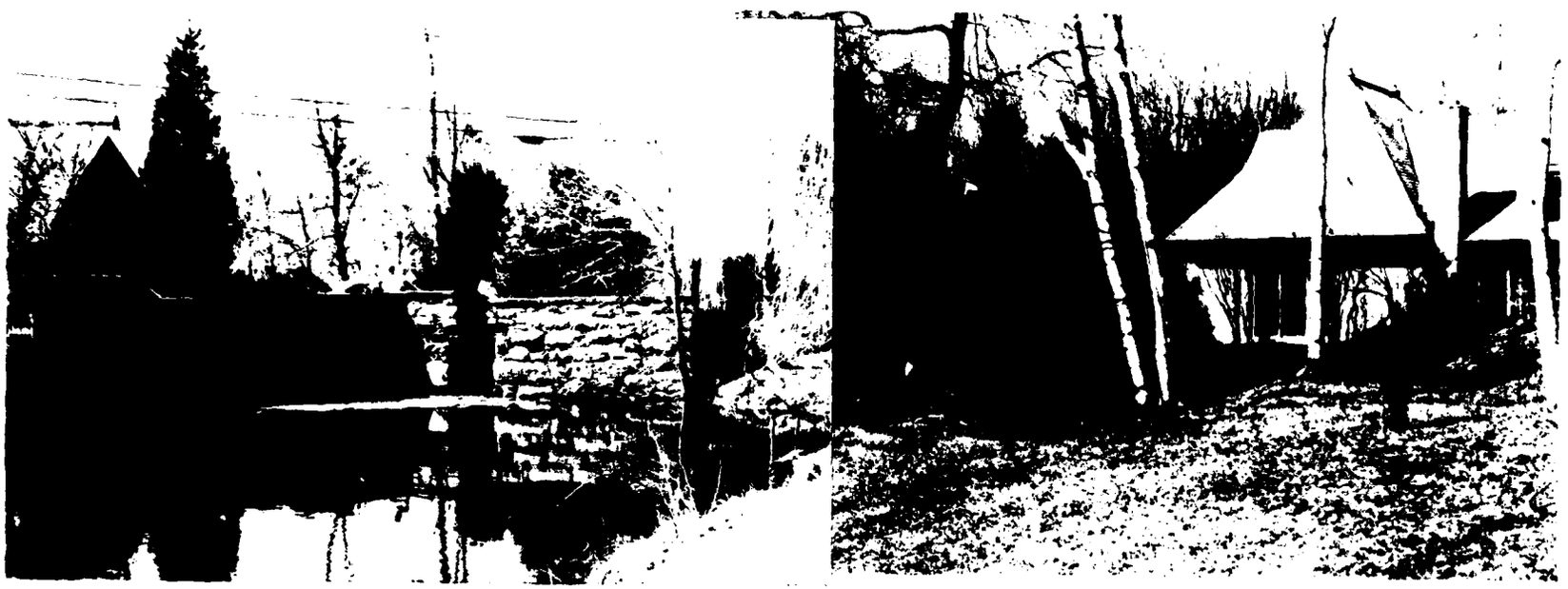
NATIONAL PROGRAM OF INSPECTION OF NON-FED DAMS

TWIN LAKES DAM

DWN. BY	CKD BY	APP BY	DATE	SCALE
MJS	NRS	RLJ	2/21/79	N.T.S.

PHOTOS 1 & 2 - Panorama of four shots taken of the upstream face of the dam from the right to left abutment from an upstream position on the right side of the reservoir.



PHOTOS NO. 3 & 4 - Panorama of four shots taken of the upstream face of the dam from the right to left abutment from an upstream position on the right side of the reservoir.

Continuation of
Photos 1 & 2

PHOTO NO. 5 - From center line of roadway looking towards the right abutment. Cedar trees range from 9 to 13 inch diameter in front of power house. Note dip in roadway adjacent to upstream gate control structure.

PHOTOS 6, 7 & 8
Panorama of three shots taken of the downstream face of the dam looking from the right abutment toward the former power house.

PHOTO NO. 9 - From crest of dam looking downstream from the right side of the old power house.

PHOTO NO. 10
From crest of dam looking downstream from the left side of the old power house.

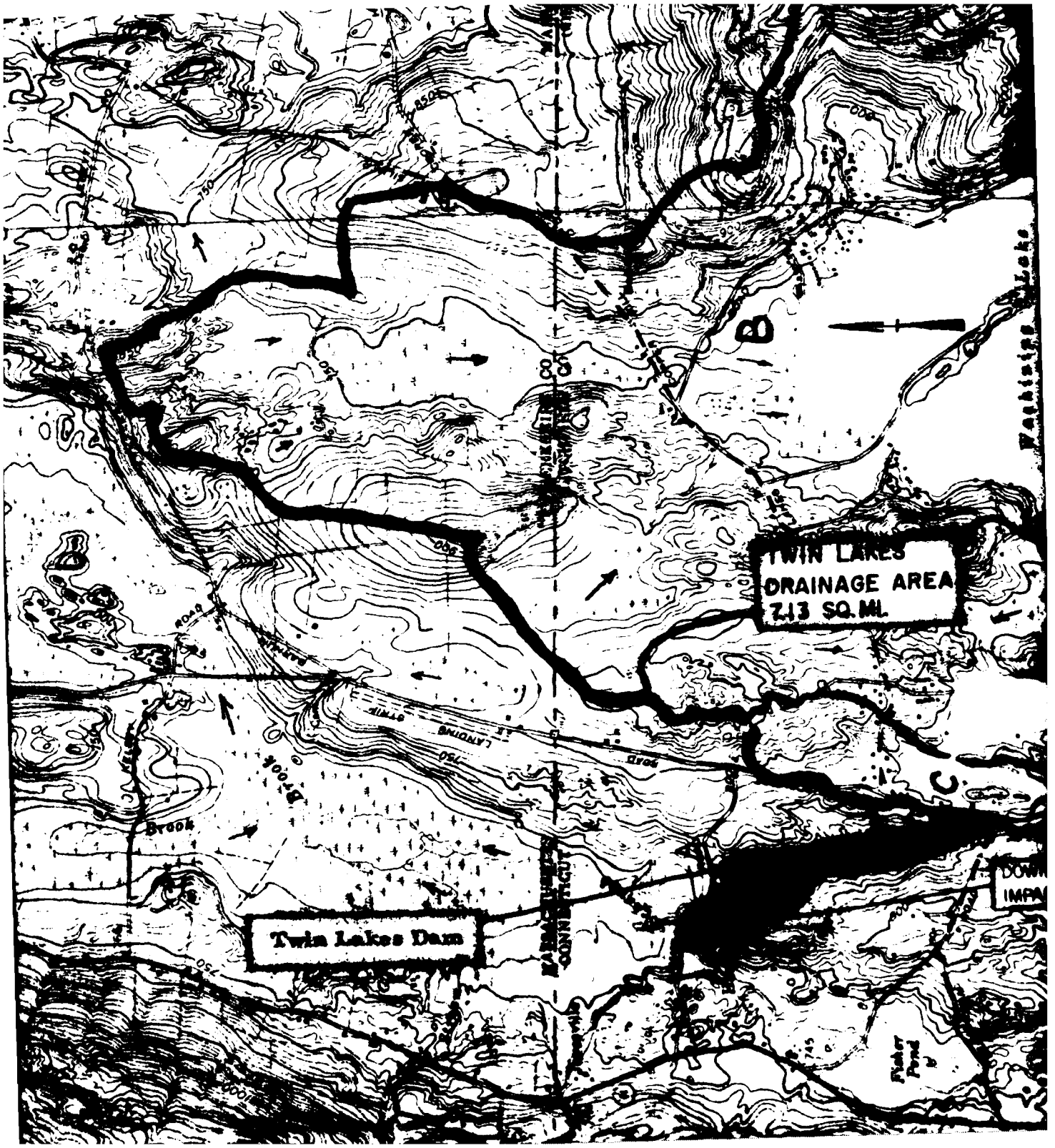
PHOTO NO. 11 - From left side of dam looking along downstream face toward the old powerhouse.

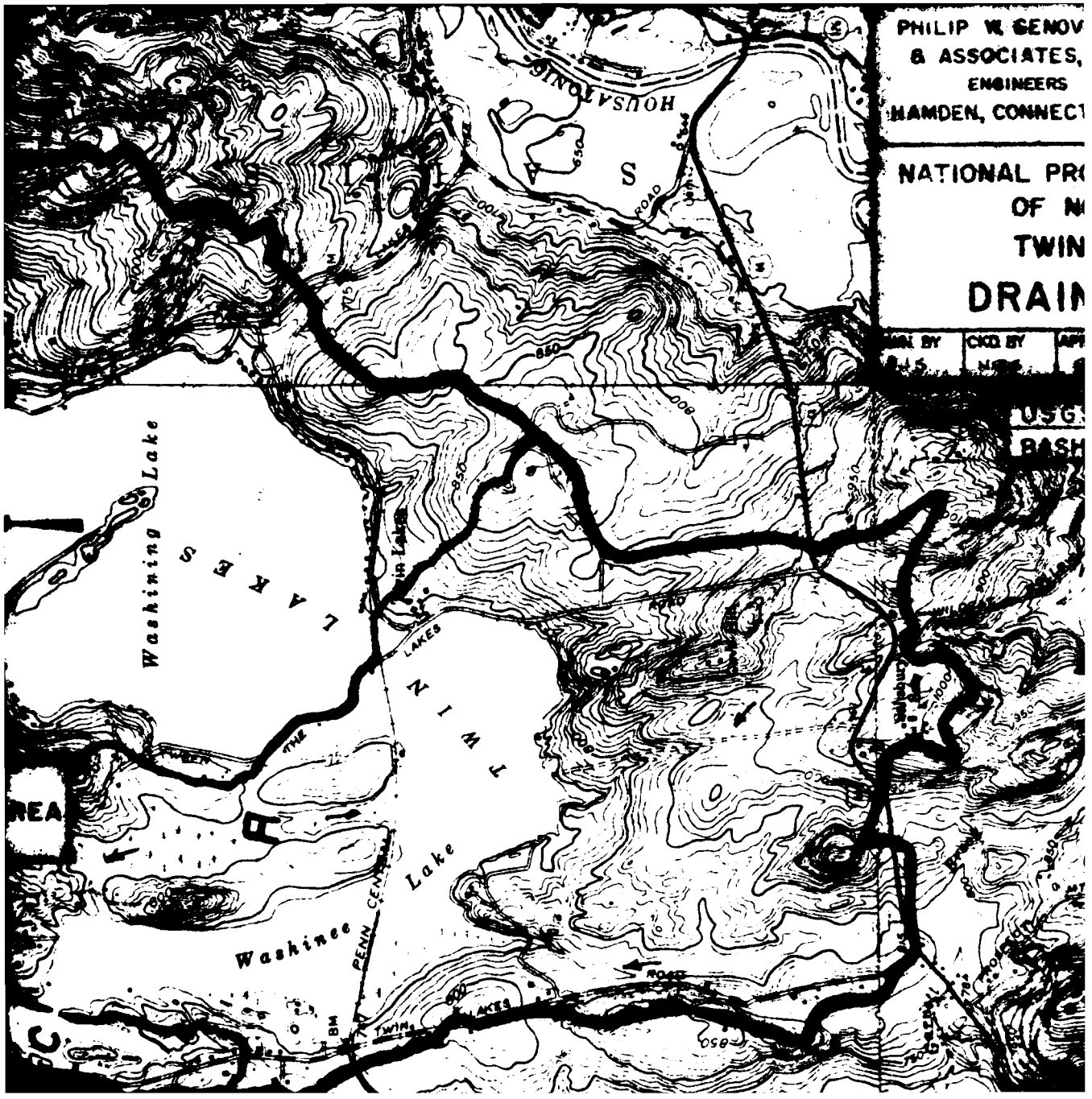
PHOTO NO. 12 - From right side of dam on crest looking toward old power house.

PHOTO NO. 13 - From right side of dam looking toward downstream toe in the vicinity of the old power house.

APPENDIX D

HYDROLOGIC AND HYDRAULIC COMPUTATIONS


TWIN LAKES
DRAINAGE AREA
7.13 SQ. MI.
Twin Lakes Dam
Brook
Brook
B
C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ENGINEERS
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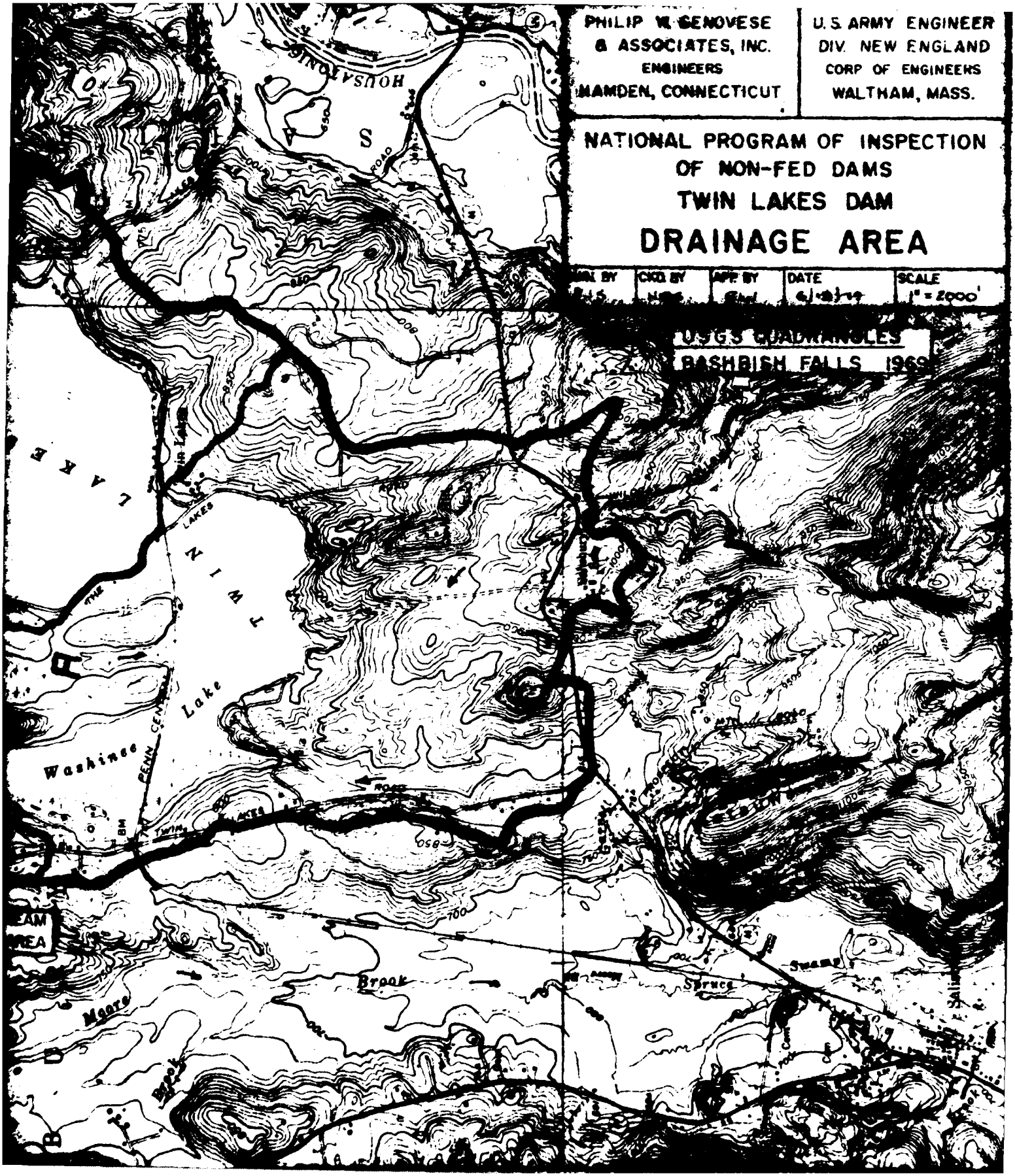
Lake
Washinee
PENN CENTRAL
HOUSATONIC
ROAD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DIV. NEW ENGLAND
CORP OF ENGINEERS
WALTHAM, MASS.
NATIONAL PROGRAM OF INSPECTION
OF NON-FED DAMS
TWIN LAKES DAM
DRAINAGE AREA
DATE
SCALE
1" = 2000'
U.S.G.S. QUADRANGLES
BASHBISH FALLS 1969
Washinee Lake
Brook
Moore
Spruce
Swamp

Name	Twin Lakes Dam
Location	Salisbury, Conn.
Drainage Area	7.13 sq-miles / 4561 Acres
Lake Area + Swamps	1.94 sq-miles (27.2%)
Top of Dam	Elev 736.0
Dam Height	20 feet
Outlet Works (1-24"ϕ & 1-36"ϕ)	Elev 727.5 & 728.5
Surcharge Storage	3600 Ac-Ft
Total Storage	9,293 Ac-Ft
Size & Hazard	Intermediate & Significant
Test Flood (TF)	½ PMF
Test Flood Runoff	9½ inches
Test Flood Volume	3610 Ac-Ft
Test Flood Qpeak	3565 cfs
Emergency Spillway	None
Breaching Discharge	4,060 cfs
Reach Outflow	4,060 cfs (4700' downstream)
Reach Outflow Flood Stage	Elev 714 (14' deep)
Normal Reservoir Level	Elev 732.0

Evaluate the size & hazard classification so as to enable the selection of the "Test Flood" that will be used in routing thru the dam.

Tables # 1, 2 & 3 of the November 1976 D.O.A. Guidelines will be utilized in determining the size of the Test Flood.

Size classification

Top of Dam = Elev 736.0
Low Point = Elev 716.0
Dam Height = 20 feet

Normal reservoir level is @ Elev 732.0. The volume of storage between Elev 732 and Elev 736 = 3600 Ac-Ft

Permanent storage below Elev 732 may be estimated as $\frac{1}{3}bh = \frac{1}{3} \times 854 \times 20'$ = 5693 Ac-Ft (This may very well be a low figure due to the expansive configuration of the lakes.) It is, however, not important as regards to the scope & direction of this analysis for this particular dam.

Total Storage = 3600 + 5693 = 9,293 Ac-Ft

From Table #1 of the guides, storage governs, & a Size classification of Intermediate is required.

Determine Hazard Classification

The dam lies within the Town of Salisbury, Ct. has a watershed area of 7.13 sq-miles, has a structure height of 20' and retains two lakes that have a combined surface area @ normal pool of 854 acres. There is an additional 386 acres that is good old New England "swamp".

The water area and swamp area make up 27.2 % of the total drainage area of 7.13 sq-miles.; ie 1.94 sq-miles.

There is a house and a vacated (private) power station immediately downstream that appear to be in jeapardy. Approximately 4700' downstream, in the vicinity of Hammertown Road there is a dairy farm and a house in the path of flooding, but on the eastern floodplain of the Schenob Brook.

Downstream of Hammertown Road Schenob Brook runs thru a network of swamps that are approximately equivalent in area to the Twin Lakes Drainage Area. The swamp network eventually outlets to the upper reaches of the Housatonic River, which @ this point in its course resembles the meanders & oxbows of the Mississippi River.

Select a hazard classification of Significant

Test Flood

From Table #3 of the O.C.E. guides, entering with a size classification of "Intermediate" and a hazard classification of "Significant" a "test flood" (Spillway Design Flood, SDF) of ½ PMF to PMP is required.

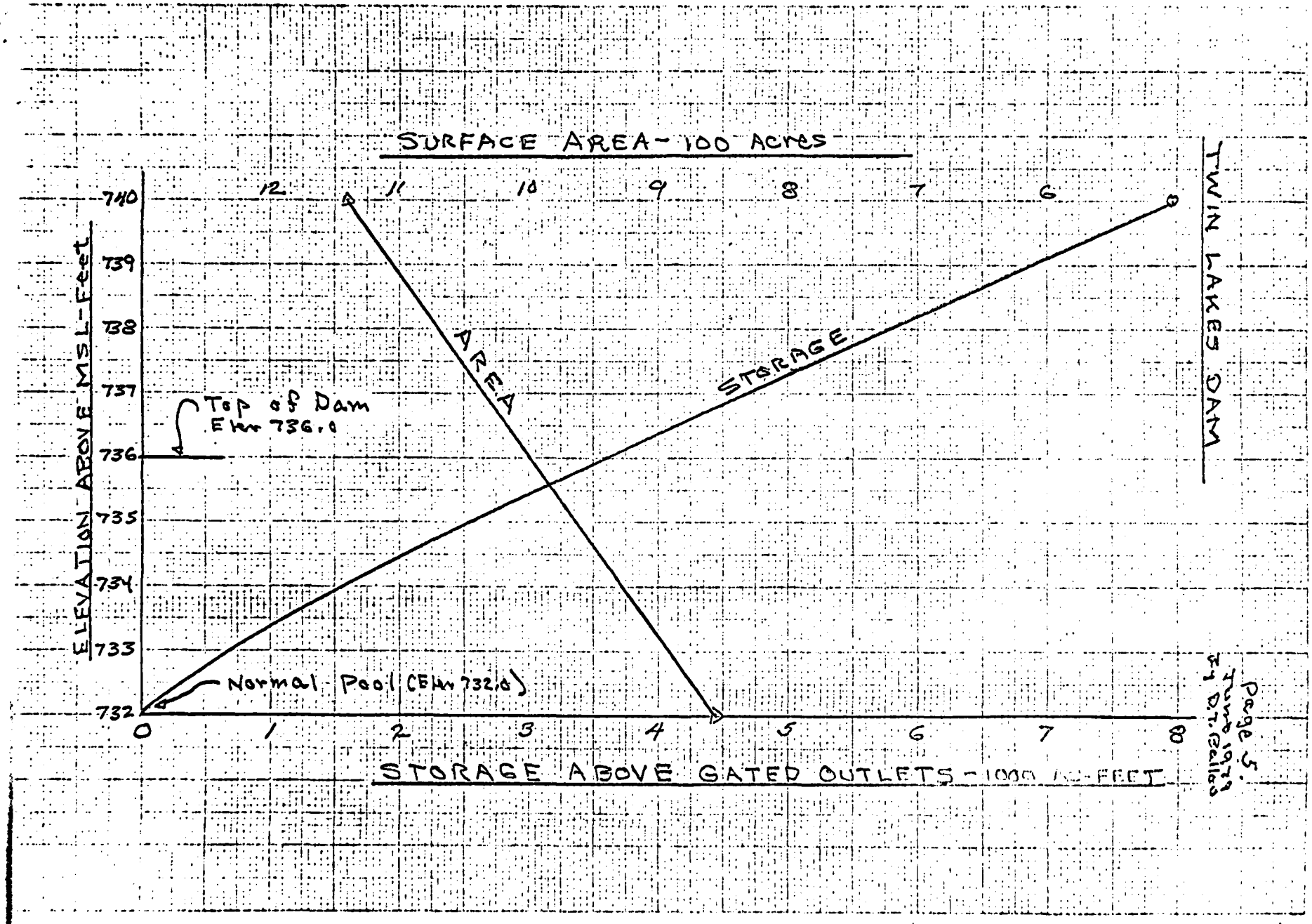
A field ε' map review of the 4700' between the dam ε' Hammartown Road indicates the terrain is such that development is discouraged. Obviously, the swamp networks will remain as such for the foreseeable future.

Select ½ PMF for the Test Flood

The watershed area = 7.13 sq-miles
= 4561 acres

Utilize comp data to select the ½PMF. Due to the unusual nature of the watershed, as discussed on page 3 as regards to swamp ε' water retention areas a terrain similar to flat ε' rolling will be selected with flat being favored. Select a PMF = 1000 cfs/mi²;
∴ ½ PMF = (1000/2)(7.13 mi²) = 3565 cfs

Volume of ½PMF = 4561 acres × $\frac{19''}{2}$ × $\frac{1'}{12''}$ = 3610 Ac-Ft



Page 5
June 1979
Ft. Worth, Dallas

A perusal of the storage curve on page 5 shows that @ elev 736 (top of dam), there is 3600 Ac-ft of surcharge storage available to receive the ½PMF, or "Test storm". On page 4 @ the bottom of the page the calculated volume of the storm (flood) is 3610 Ac-ft.

It would certainly appear that there is no further need to proceed with a discharge analysis of the outlet works for Twin Lakes Dam. However, a rating curve shall be worked up for guidance as an indication of probable discharge over the dam.

Twin Lakes Dam would appear to be an enigma as regards to "standard" features for reservoir outlets to handle storm discharges. There have been no precautions taken to handle "excess" storm flows. The originators of the dam & power station undoubtedly felt that it was not necessary. The dam & power station were apparently built by the Scoville's; a private venture. The designers of the dam & power station undoubtedly felt that the immense storage and attenuation characteristics of the Twin Lakes drainage basin were such as to nullify any detrimental effects of storms, small or large, that would pass thru the region; See comments, page 3.

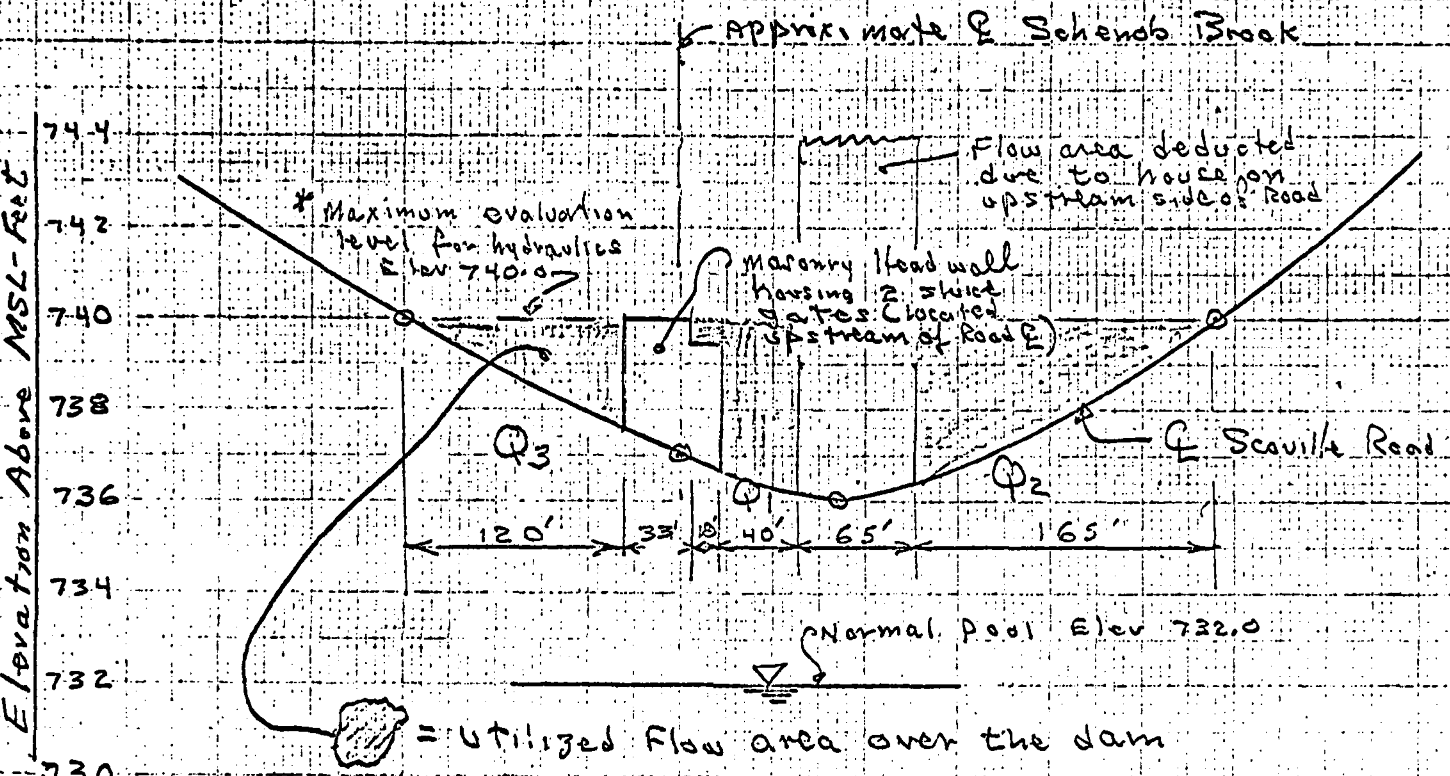
The dam proper is quite difficult to delineate in the field. From a field reconnaissance of what appear to be prior natural features it is estimated that the dam proper has a crest length in the vicinity of 100 feet. The maximum height of the dam is 20 feet. The width of the dam, upstream-downstream axis is approximately 90 feet which leads to a width to height ratio of 4.5. This ratio would indicate a rather good stability characteristic in terms of a general structure assessment.

The outlet works for the dam consist of one 36"Ø & one 24"Ø pipe; both are gated on the upstream end with vertically mounted cast iron sluices. The gates are handwheel operated. One pipe leads thru the powerhouse which is presently not in operation. The 24"Ø pipe leads to the stream channel east of the power house. The maximum possible discharge capability of these two lines, combined, with no losses, is 225 cfs. For this reason they will not be included in the rating curve for the dam.

See following pages for data used in working up rating curve for the dam

TWIN LAKES DAM

June 1979
D T Ballou



℄ PROFILE OF SCOVILL ROAD (Top of Dam)

LOOKING DOWNSTREAM

Horizontal Scale: 1" = 100'

Vertical Scale: 1" = 4'

* This elevation would contain the runoff from a PMF if it had been selected.

The rating data for discharge over the dam is approximate only & should be evaluated in detail via a full field investigation if serious use is considered in future determinations.

Please note that the selected Test Storm = ½ PMF & this storm volume will be contained without overtopping the dam and without releasing any of the storm inflow downstream.

Also note that the predicted storm peak of 3,565 cfs could very well not materialize due to the rather unusual attenuating factors of the Twin Lakes drainage basin; see page 3.

The rating curve will extend no further than elev 740 as this is the elevation that would contain the total runoff of 19" from a PMF.

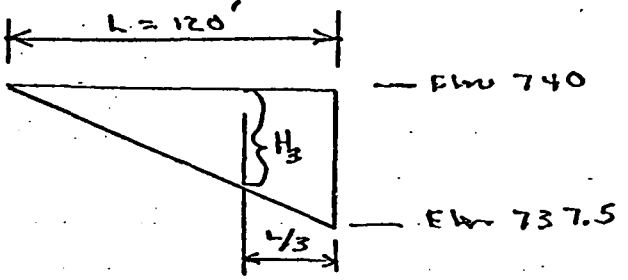
See following pages for calcs.

Twin Lakes Dam

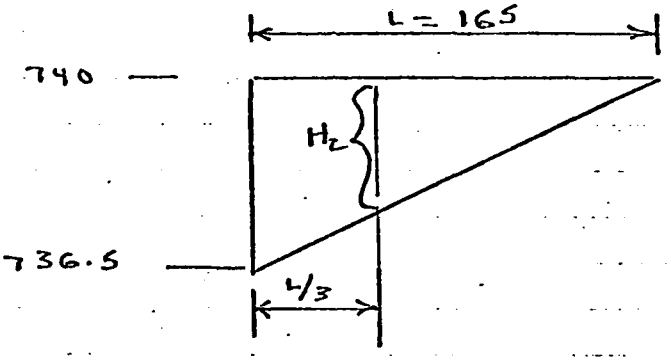
June 1979
D T Ballou

Vertical Flow Areas Looking Downstream
(see page 8)

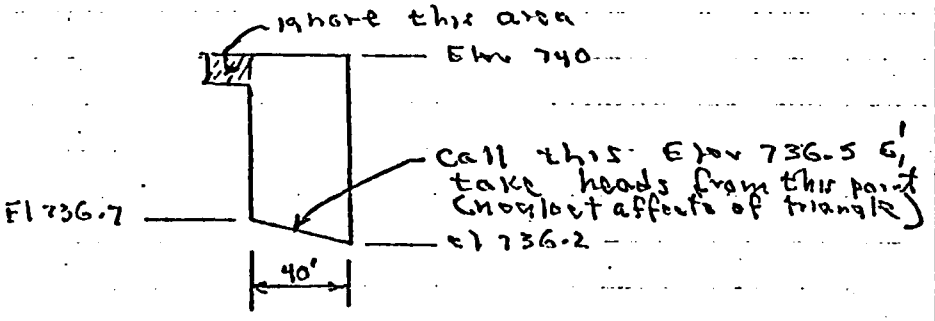
$Q_3 = C L_3 H_3^{3/2}$ (Heads & L/3 vary)



$Q_2 = C L_2 H_2^{3/2}$ (Heads 5', L/3 vary)



$Q_1 = C L_1 H_1^{3/2} = 2.7 \times 40 \times H^{3/2} = 108 H^{3/2}$



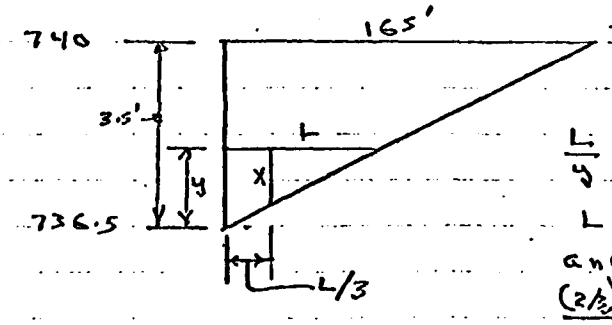
Note: Use C = 2.7 for all cases.

Dam overflow Rating Data

See previous page for backup

Elev	H_1/L_1 ft/ft	H_2/L_2 ft/ft	H_3/L_3 ft/ft	Q_1 cfs	Q_2 cfs	Q_3 cfs	ΣQ cfs
736.5	—/—	—/—	—/—	—	—	—	—
737.5	1.0/40	.67/47.14	—/—	108	70	—	178
738.5	2.0/40	1.33/94.28	.67/48.0	305	390	71	766
739.5	3.0/40	2.0/141.4	1.33/96	561	1080	398	2039
740.0	3.5/40	2.33/165	1.67/120	707	1584	699	2990

* Example!



Compute:

$y = 3.5$, $\therefore H_2 = \frac{2}{3}y = 2.0$

(properties of triangle!)

$L = 47.14 \times 3 = 141.4$

(also 739.5 − 736.5)

$\frac{L}{y} = \frac{165}{3.5}$

$L = 47.14\ y$

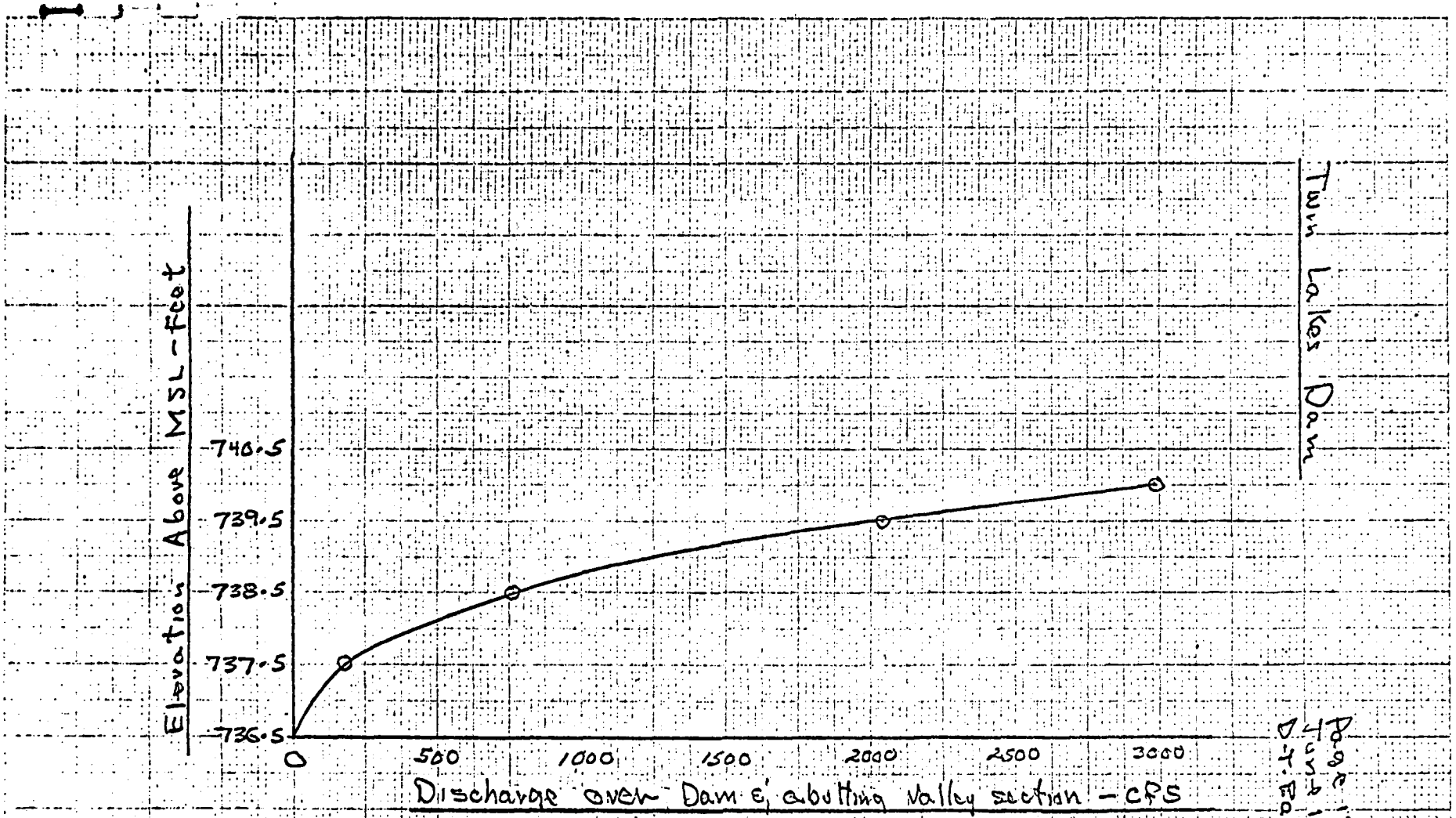
and

$\frac{(2/3)L}{x}$ as $\frac{165}{3.5}$

$x = \frac{3.5}{165} \times \frac{2}{3} L = \frac{2}{3} y$

and

x becomes Head → H_2



Page 12
June 1979
D.T. Pollon

As discussed earlier — no routing of the ½ PMF thru the lakes was accomplished due to the fact that the entire storm is stored within the lakes with no overtopping taking place.

There will, of course, be minor flooding of those houses along the shoreline of the lakes where the house is located below elevation 736; obviously no houses along the lake are located below elev 732.0.

A breaching calculation shall be made @ least one valley section downstream of the dam shall be evaluated in order to determine if any major problems would exist from dam failure.

see following pages

Twin Lakes Dam

Work up rating curve for Section A-A which is 4700' downstream of Dam @ Hammertown Road

$$Q = A\frac{1.49}{n} R^{2/3} S^{1/2}$$

$$n = 0.070$$

$$S = \text{Elev } 710-700/4000' = 0.0025$$

$$S^{1/2} = 0.050$$

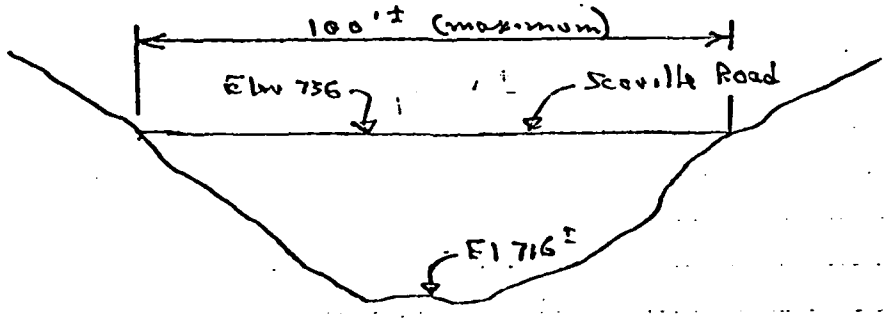
$$Q = A\frac{1.49}{0.070} R^{2/3} 0.050$$

$$= 1.06\ A R^{2/3}$$

Elev	Area ft^2	WP ft	R ft	$R^{2/3}$	Q cfs
700	—	—	—	—	—
710	625	120	5.21	3.00	1991
715	1437	255	5.64	3.17	4824
720	2875	390	7.37	3.79	11,543

Twin Lakes Dam

Estimate Dam Breaching Discharge



Vertical Section Along ℄ Dam (Scoville Road)

Dam width @ mid height ≅ 70'

Failure width ≅ 40 % × 70 = 28' = Wb

Y_o = El 736 - 716 = 20'

Peak Failure Outflow = $\frac{8}{27} \times Wb \times g^{1/2} \times Y_o^{3/2} = Q_{p_1}$

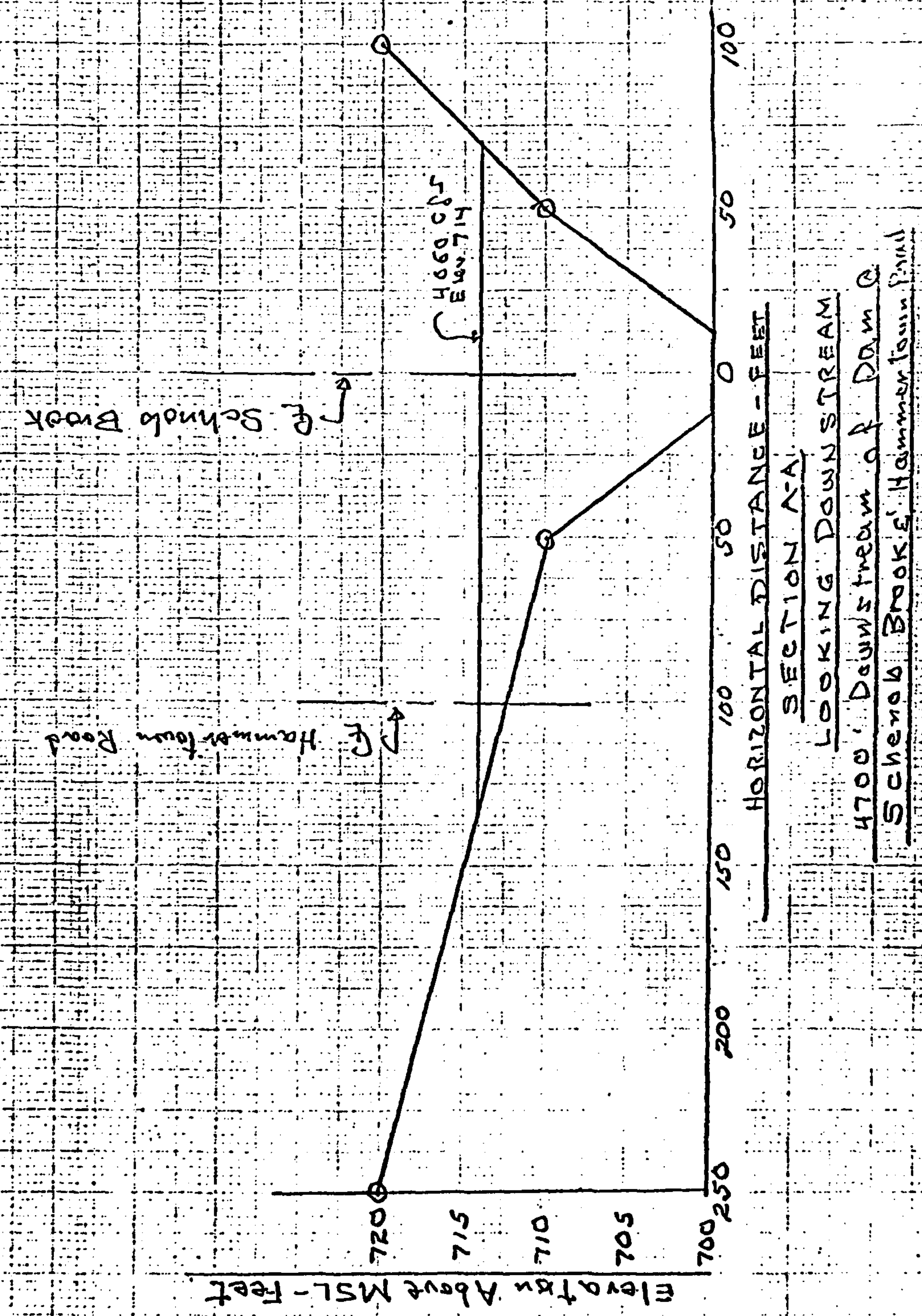
$Q_{p_1} = \frac{8}{27} \times 28 \times \underset{\llcorner 5.67}{32.2^{1/2}} \times \underset{\llcorner 89.44}{20^{3/2}}$

= 4,060 cfs

Failure wave height ≅ 13'

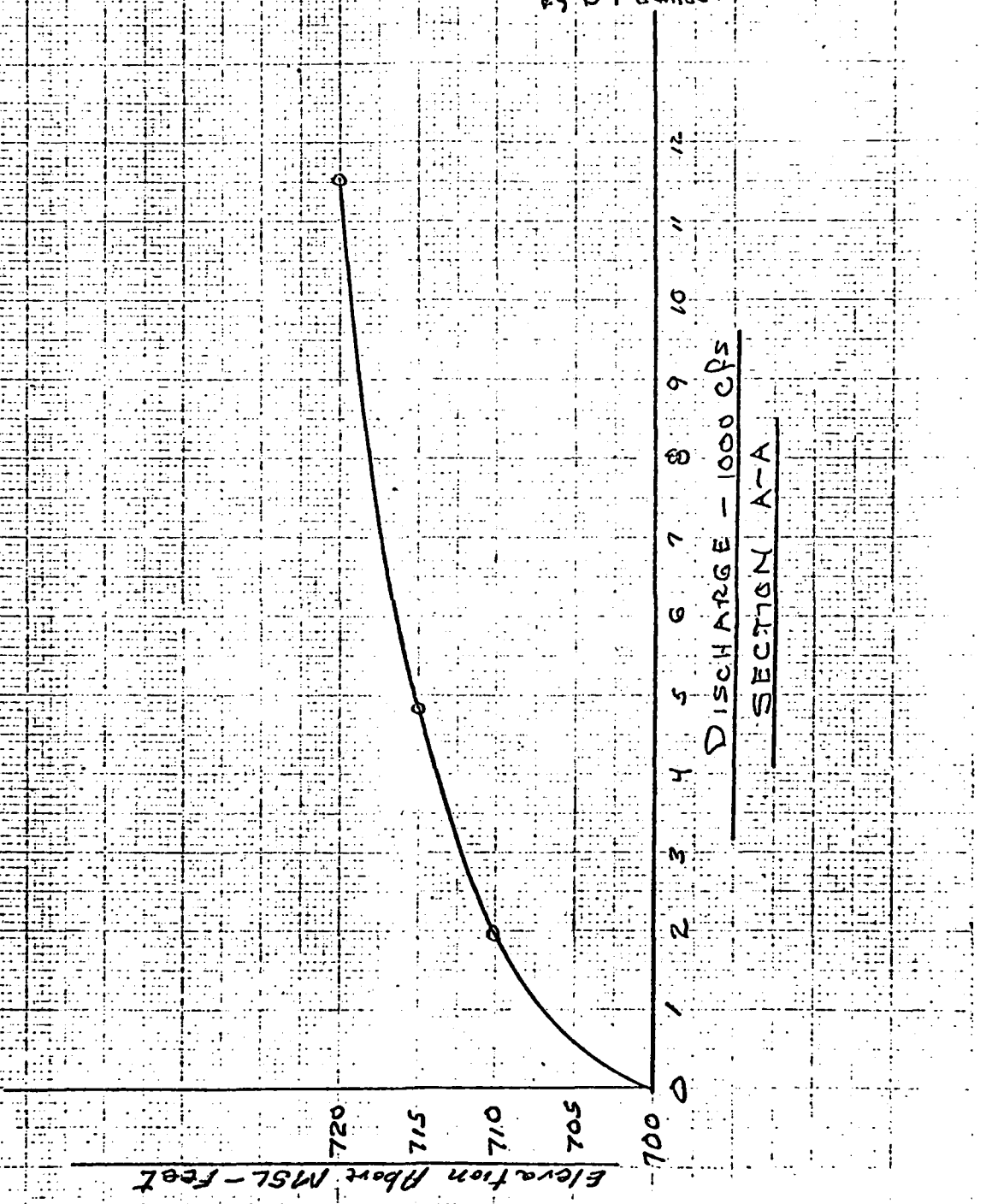
Page 15
June 1979
By DT Ballou

Twin Lakes Dam



Page 17
June 1979
By D T Ballou

Twin Lakes Dam



SECTION A-A

Comments

The breaching calculation was performed and a valley section appraised about 4700' downstream @ Hammertown Road & Schenob Brook. In view of the immense storage behind the dam no stream routing was accomplished as it would not have any affect on the total volume within such a short reach as 4700 feet. The section shows a flooding to elev 714 @ Hammertown road. This would wipe out @ least one house &, considerably innundate the dairy farm just upstream of Hammertown Road.

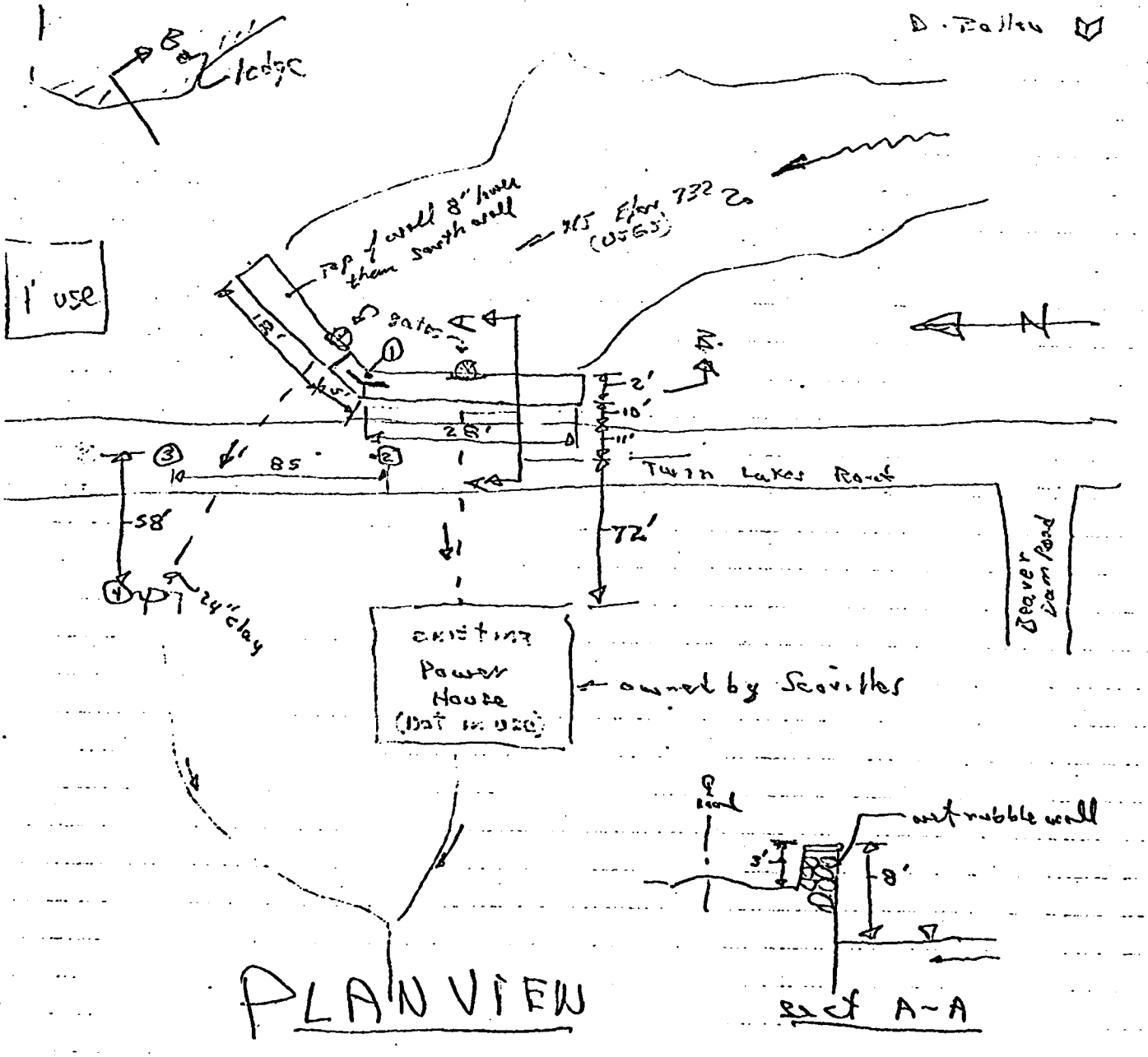
The decision to go with "Significant" as a hazard classification would not appear to be in jeopardy @ this time. ∴ let the classification stand.

Local natives indicate no recollection of Twin Lakes Dam ever being topped.

Twin Lakes Dam
Salisbury Conn.

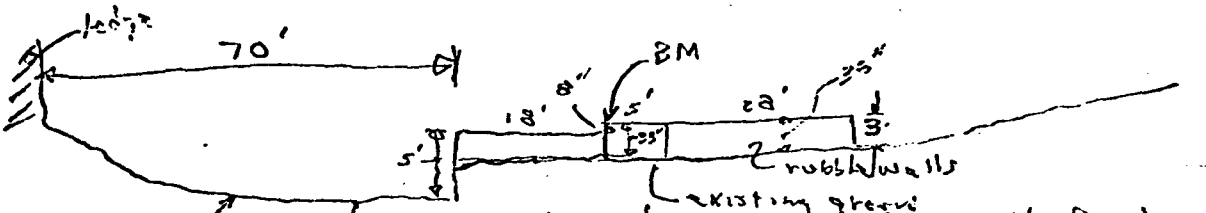
April 23, 1979 (pm)
By D.T. Ballou

Dick Murdock
Tom Engle
R. Jones
D. Ballou



Twin Lakes Dam
Salisbury, Conn

April 23 1979 (FM)
By D T Ballou



Section B-B
Looking Upstream

Point	Item	BS	FS	Elev	
		HI = 740.33			
1	BM	0.33		740.00	Top of wall
2	℄ Road off Dam face		3.15	737.18	
3	℄ Rd		4.28	736.05	
4	outlet invert		13.34	727.00	24" ∅

Note: Riser pipe just downstream of the old powerhouse is approximately 20.5 feet below road.

APPENDIX E

INFORMATION AS CONTAINED IN THE INVENTORY OF DAMS

INVENTORY OF DAMS IN THE UNITED STATES

(1) STATE	(2) IDENTITY NUMBER	(3) DIVISION	(4) STATE	(5) COUNTY	(6) CONGR DIST.	(7) STATE	(8) COUNTY	(9) CONGR DIST.	(9) NAME	(10) LATITUDE (NORTH)	(11) LONGITUDE (WEST)	(12) REPORT DATE DAY | MO | YR
CT	593	NED	CT	005	06				TWIN LAKES DAM	4200.0	7324.7	09JUL79

(13) POPULAR NAME	(14) NAME OF IMPOUNDMENT
	TWIN LAKES

(15) REGION	(16) BASIN	(17) RIVER OR STREAM	(18) NEAREST DOWNSTREAM CITY–TOWN–VILLAGE	(19) DIST FROM DAM (MI.)	(20) POPULATION
01	07	SCHENOB BROOK	TACONIC	0	

(21) TYPE OF DAM	(22) YEAR COMPLETED	(23) PURPOSES	(24) STRUCTURAL HEIGHT (FT.)	(25) HYDRAULIC HEIGHT (FT.)	(26) IMPOUNDING CAPACITIES MAXIMUM (ACRE–FT.)	(27) NORMAL (ACRE–FT.)	DIST	OWN	FED R	PRV/FED	SCS A	VER/DATE
REPG	1900	R	20	20	9293	5693	NED	N	N	N	N	

(28) REMARKS
14=WASHINEE LAKE + WASHINING LAKE 20=LESS THAN 1000

(29) D/S HAS	(30) SPILLWAY CREST LENGTH	(31) TYPE	(32) WIDTH (FT.)	(33) MAXIMUM DISCHARGE (F.T.)	(34) VOLUME OF DAM (CY)	(35) POWER CAPACITY INSTALLED (MW)	(36) PROPOSED (MW)	(37) NAVIGATION LOCKS NO.	(38) LENGTH (FT.)	(39) WIDTH (FT.)	(40) LENGTH (FT.)	(41) WIDTH (FT.)	(42) LENGTH (FT.)	(43) WIDTH (FT.)	(44) LENGTH (FT.)	(45) WIDTH (FT.)
2	100															

(46) OWNER	(47) ENGINEERING BY	(48) CONSTRUCTION BY
TOWN OF SALISBURY		

(49) REGULATORY AGENCY DESIGN	(50) CONSTRUCTION	(51) OPERATION	(52) MAINTENANCE
NONE	NONE	NONE	NONE

(53) INSPECTION BY	(54) INSPECTION DATE DAY | MO | YR	(55) AUTHORITY FOR INSPECTION
PHILIP W GENOVESE + ASSOC	23APR79	PUBLIC LAW 92-367

(56) REMARKS
31=NONE

of 3,500 cfs could very well materialize due to the rather el attenuating factors of the Lakes drainage basin; see page 3.

rating ourve will extend no
n than elev 740 as this is
elevation that would contain
total runoff of 19" from a PMF.

following pages for calcs.